

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **88300815.3**

(51) Int. Cl.4: **C 12 Q 1/06**
// C12M1/34, G01N27/22

(22) Date of filing: **01.02.88**

(30) Priority: **04.02.87 JP 22481/87**
09.09.87 JP 224018/87
06.11.87 JP 279060/87

(43) Date of publication of application:
10.08.88 Bulletin 88/32

(84) Designated Contracting States:
AT CH DE FR GB IT LI NL SE

(88) Date of deferred publication of search report:
05.10.88 Bulletin 88/40

(71) Applicant: **KABUSHIKI KAISHA KOBE SEIKO SHO**
3-18, Wakinohamacho 1-chome Chuo-ku
Kobe-shi Hyogo-ken 651 (JP)

(72) Inventor: **Mishima, Ken**
A2-414 Shinsenri Minami-cho
Toyonaka-shi Osaka (JP)

Mimura, Akio
435-7 Miyashita
Fuji-shi Shizuoka (JP)

Takahara, Yoshimass
5-28-8 Yatsu
Narashino-shi Chiba (JP)

Asami, Kouji
Yaocho 8 Higashihorikawa Nishihairu Shichijyo-dori
Shimogyo-ku Kyoto-shi Kyoto (JP)

Hanai, Tetsuya
115 Tougawa
Uji-shi Kyoto (JP)

(74) Representative: **Wright, Hugh Ronald et al**
Brookes & Martin High Holborn House 52/54 High
Holborn
London WC1V 6SE (GB)

(54) **Method for measuring biomass.**

(57) A method for measuring a biomass which comprises measuring an electric capacitance across at least one pair of electrodes attached to a bioreactor, and thereby continuously measuring a biomass of organisms (such as microorganism and plant or animal cells), which may or may not be immobilized in the bioreactor, according to the electric capacitance (dielectric permittivity) measured. The present invention permits one to measure on-line the quantities of microorganisms or plant or animal cells without having to take samples from a bioreactor or culture tank.

EP 0 277 789 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 30 0815

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|---|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.3) |
| X | GB-A-2 136 130 (T.H. KRUEGER et al.) * page 5, line 103 - page 6, line 18; claims 1,7,15 * --- | 1-5,7 | C 12 Q 1/06 // C 12 M 1/34 G 01 N 27/22 |
| X | GB-A-2 177 801 (MALTHUS INSTRUMENTS LTD.) * page 2, lines 6-8; claims 1-10 * --- | 1,2,4,5 | |
| X | DE-A-2 412 165 (P.J. METZGER) * page 4, lines 27 - page 5, line 5; claim 1 * --- | 1 | |
| A | IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, vol. BME-33, no. 2, Februar 1986, pages 242-247, New York, US; I. GIAEVER et al.: "Use of electric fields to monitor the dynamical aspect of cell behavior in tissue culture" * whole document * --- | 1,4,6-8 | |
| A | W.H. NELSON "Instrumental methods for rapid microbiological analysis", 1985, VCH Publishers, Inc., US; * pages 192-209 * --- | 1-8 | TECHNICAL FIELDS SEARCHED (Int. Cl.3) |
| E | WO-A-8 802 114 (D.B. KELL) * claims 1-6; page 7, lines 7-19 * --- | 1-8 | C 12 Q 1/00 G 01 N 27/00 C 12 M 1/00 G 01 N 33/00 |
| E | WO-A-8 802 115 (D.B. KELL) * claims 1-12; abstract * ----- | 1-8 | |
| The present search report has been drawn up for all claims | | | |
| Place of search BERLIN | | Date of completion of the search 07-07-1988 | Examiner DE KOK A.J. |
| CATEGORY OF CITED DOCUMENTS | | | |
| X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document | | T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document | |

EPO FORM 1503 03.82 (P0401)